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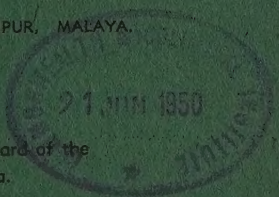

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CENTRALISED PROCESSING OF SMALLHOLDERS' LATEX AND RUBBER

Experiment 1. Kampong Batu Hampar, Kedah

by

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and

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Summary

1. A satisfactory organisation has been established at Kampong Batu Hampar, Merbok, Kedah, for the processing of smallholders' latex from an area of about 500 acres. The simple equipment necessary for such a project is described.

2. Production of first quality rubber from smallholders' latex by centralisation of processing has been demonstrated as a practicable development. Smallholders have been enabled to maintain their income from their rubber areas and have increased time for other gainful occupation or leisure. A reasonable profit can be obtained by the operator provided that he turns out Grade 1 rubber.

3. Increased centralisation of the processing of smallholders' latex may be of special importance to the country because new developments and improvements in technique will be more readily applied to the produce of the whole industry.

Introduction

From its inception in 1934 until the outbreak of the Japanese war the efforts of the Rubber Research Institute Smallholders' Advisory Service were directed, in so far as rubber manufacture was concerned, to the improvement of the individual peasant's product by providing information on the necessary simple equipment required by the small-scale producer and advice on appropriate technique for the manufacture of sheet rubber. Considerable initial improvement was possible particularly in those areas which had previously turned out a form of slab rubber suitable only for re-milling. The propaganda effort required to maintain the first improvement was high and a considerable deterioration was to be expected in the period following the re-occupation.

Lack of equipment, shortage of essential supplies, particularly of good acid, and the break in advisory assistance can be considered contributory factors in the decline. The high

cost of labour and the need for diversion of effort to alternative employment and production of foodcrops reduced the incentive to the small producer to take that extra care which is necessary to produce rubber of first quality. The high cost of labour has emphasised the lack of economy in the practice of small-scale smoking of rubber. The unsettled conditions of the country, the risk of theft and destruction. have further made the smallholder unwilling to leave his rubber in one of the small flimsy smoke-cabinets which had seemed a suitable development in more peaceful times.

Early work on Improvement in Processing of Smallholders' Rubber

It has been the general experience of Rubber Instructors that after the simple technique of good sheet production has been taught to smallholders, continual demonstration and repetition of advice has been necessary to maintain the standard from the individual who both taps his trees and processes the daily crop. It is probable that the cost of such continuous individual service, necessary to maintain high quality production from smallholding areas under the conventional system of processing, would out-weigh any increased value of the rubber.

On the other hand, observation of a few isolated cases has shown that specialisation of labour on processing has been developed with satisfactory results in the smallholders' coagulating shed. Such cases have demonstrated clearly that first quality rubber can be made with simple equipment provided that attention is paid to cleanliness and details of technique. This is obtained when one man has a full time occupation in processing latex from a group of tappers.

Our early efforts to secure extension of the principle of centralised manufacture of smallholders' rubber were concentrated on encouragement of co-operative enterprises. Although progress in the field was slow it was considered desirable to continue the work towards the co-operative goal in order that smallholders should be encouraged to obtain for themselves full benefits from centralisation of processing.

More recently however the urgent need to secure improvement in the quality of Malayan rubber, and to provide for future technical developments in processing being made available to the whole range of Malayan producers have made it necessary to investigate alternative procedures. For these reasons the Rubber Research Institute decided to

Factory at Kampong Batu Hampar.

Smokehouse with latex recorder on right

undertake further investigation of different methods of centralised manufacture of rubber in smallholding areas and to endeavour to evolve a system which will achieve the desired improvement in the quality of the smallholders' product for his own benefit and for the good name of Malayan produce.

The Merbok Project

Towards the end of 1948 a suitable opportunity for investigation presented itself at Merbok, in the Kuala Muda District of Kedah, where an organisation for the purchase of liquid latex from smallholders by a large producer of latex concentrates was to be discontinued. The circumstances were favourable to the establishment of a central factory because the preceding organisation had been carefully built up with the assistance of the Rubber Instructor who had advised and encouraged the smallholders and had secured their confidence in the system of disposing of their crop as latex and accepting payment on the basis of dry rubber content (d.r.c.) as determined by sample coagulation. Latex production from the holdings in the district had reached a high standard of cleanliness and the smallholders in the area were in fact apprehensive of the loss of the outlet for their latex which, after a period of thirteen months, they had come to accept as a part of their system of production.

Haji Ahmad bin Haji Omar a Malay rubber dealer and member of the Merbok kampong community, who had contributed to the success of the preceding latex purchasing scheme by acting as a collecting agent for the more outlying holdings, was prepared to organise a small scale factory. Haji Ahmad was joined by two partners 'Che Saidin and 'Che Shuib and they agreed to operate a small factory on lines to be advised by the Rubber Research Institute and with assistance provided by the Rubber Research Institute in the form of a loan of working capital and equipment.

An inspection of the area was undertaken by Mr. A. Walker, Chemical Engineer and a site was selected at Kampong Batu Hampar in suitable relationship to the collecting area with a good supply of clear water from a stream. A simple open shed with an attap roof and a concrete floor was constructed to house manufacturing equipment and a R.R.I. temporary-type smoke-house of split bamboo and gunny sacking was built to provide for curing. The dimensions of the buildings, the materials used and their cost and the equipment assembled for processing are set out in Appendix "A".

Much of the equipment was provided by the Rubber Research Institute and a loan was given to cover the stocks of rubber which must be held in the smoke-house and awaiting sale in amounts which will allow economic transport. Haji Ahmad is repaying the cash loan in regular instalments and it is intended that he will ultimately be given the opportunity to purchase all the equipment now in use.

The factory commenced operations at the beginning of March 1949. Since that date latex supplies have been purchased from 109 holdings totalling 313 acres though a small proportion of these have been somewhat irregular suppliers. The trees in the Merbok area are all very old and have suffered from excessive tapping in the past. Small yields of very low d.r.c. latex (25% — 30%) are obtained and the factory has not yet operated to full capacity. A satisfactory average through put of about 2 piculs per tapping day has been obtained in the last few months.

Latex from smallholdings close to the factory is normally sold direct to the factory and payment made on actual d.r.c. In the initial stages collection from outlying holdings was made by men who carried the latex in specially made 10 gallon containers on bicycles. These men received a commission of 6 cents per gallon on the latex but this proved too expensive and they have been replaced by youths on daily wages. Smallholders whose latex is collected by the factory organisation are paid on the average d.r.c. of the lot and at a rate slightly below that for those who transport their latex to the factory. The organisation has managed to maintain payments to smallholders at approximately the local prices for Grade III unsmoked sheet less a small discount where transport to the factory is required.

Latex received at the factory is sampled by extracting 38.3 c.c. from the properly mixed bulk by means of a "tahil" dipper. This latex is coagulated with about 10 c.c. of 1% formic acid and the coagulum machined and dried in the smoke-house. Weighing is done with a Chinese goldsmith's balance ("chee" or "daching") and the reading in hoons (1/100 of a tahil) gives the percentage d.r.c.

Latex is poured through a double strainer into a coagulating tank and a simplexometer is used for standardisation. Formic acid is used in sufficient quantity to allow machining to be done the same day. Machining is done by hand and can normally be completed in less than two hours. The machined sheets are then allowed to soak in water over-

Weighing a smallholders latex.

Sampling a smallholders latex.

night and are hung up to drip in the shade for about 2 hours before being transferred to the smoke-house. Smoking is completed in about 5 days.

The present factory staff consists of four labourers which includes the smoke-house keeper and watchman. They receive $3/- per picul of smoked sheet produced and the watchman receives an additional $10/- per month.

The total production monthly, the grades of rubber produced, the cost, receipts and average profit during the period March - December 1949 are set out in Appendix "B". The figures show clearly the early difficulties of the operators which were overcome as they became familiar with the requirements of good management. The gradual increase in the proportion of R.S.S.1 has been particularly gratifying. Present results indicate that the time is opportune for gradual expansion of production and this would most probably have taken place but for the fact that the rubber at Kampong Batu Hampar is too old and deteriorated to provide the extra crop. Otherwise there is no reason why such factories in suitable rubber areas should not increase production until by the installation of mechanically driven rollers they are able to effect economies in processing costs.

In calculating the profit per picul in Appendix "B" no allowance has been made for depreciation. While the more expensive items of equipment required for coagulating and machining should, with reasonable care, have a very long useful life, the relatively temporary structures of the factory smoke-house and watchman's quarters will require fairly extensive renewal every three years. At current rates of production and costs a charge of 25 cents per picul would make ample provision for this necessity.

Plans for Extension of the Merbok System

The supervision of the field work in the establishment of the Merbok factory has been carried out entirely by the second of the authors of this paper. His work has shown the need for careful approach to the people in a district in which it is proposed to operate a central factory for the processing of smallholders' latex.

It is desirable that the people should be generally free from indebtedness and that the potential yield of an area from which latex is promised for a factory should be at least twice as great as the intended capacity of the factory. Smallholders are not generally familiar with methods of d.r.c.

estimation and are therefore likely to regard systems of purchasing latex with suspicion. Their confidence appears to be most readily obtained by one who mixes freely with them, on business, religious and social occasions and identifies himself completely with their way of life. Little progress can be expected unless there are clear indications to the people that the technical expert has the confidence of the officials to whom they naturally turn for guidance — the Ketuas, the Penghulu and the District Officer.

Acknowledgments

We have to record our appreciation of the active interest and encouragement which our efforts have received from Mr. J. Cook who, acting as State Agricultural Officer, Kedah, throughout the period of trial of the Batu Hampar factory, has given our efforts all possible support.

We are indebted to 'Che Mohd. bin Yaacob, District Officer, Kuala Muda, for his co-operation and interest. Our thanks are also due to Mr. T. N. Speers of Sungei Batu Estate who undertook at short notice to process the smallholders' latex for a few days while equipment was being assembled and so prevented an early set back to the project.

APPENDIX "A"

CENTRAL FACTORY AT KAMPONG BATU HAMPAR KEDAH

Expenditure on cost of erection and equipment

Appendix "A"

Compiled by Mohd. Rouse b Hj. Mohd. Amin

1. **THE FACTORY:**

(a)

Dimensions	—	30′ × 12′ × 10′
Floor	—	cemented with surrounding drains
Roof	—	attap
Pillars and framework	—	jungle-rollers

(b) **Materials and cost:**

i.	12	pieces jungle rollers (pillars) 12′ × 5″	$ 10.80
ii.	8	pieces jungle rollers 15′ × 4″ ...	8.00
iii.	20	pieces jungle rollers 16′ × 3″ ...	14.00
iv.	10	pieces "Kasau jantan" (main rafters and purlins) 10′ × 3″	7.00
v.	50	pieces "kasau kechil" (rails) ...	7.50
vi.	450	pieces attaps	9.00
vii.	7½	lbs. nails	2.70
viii.	8	bags cement	36.00
ix.	5	cubic yards sand	15.00
		Total ...	$160.00

2. **WATCHMAN AND STORE SHED:**

The cost of erecting one shed with attap roof and attap wall — 20′ × 10′ × 8′ ... $ 60.00

3. **THE R.R.I. TEMPORARY-TYPE SMOKE-HOUSE:**

(a)

Dimension	—	12′ × 15′ × 15′ (capacity 20 piculs)
Roof	—	Gunny sacking and attap
Pillars and framework	—	Jungle-rollers
Walls	—	Split bamboo with gunny sacking

(b) **Materials and cost:**

i.	2	pieces jungle-rollers (pillars) 14′ × 5″	$ 8.00
ii.	8	pieces jungle-rollers 12′ × 4″ ...	5.60
iii.	9	pieces jungle-rollers 12′ × 3″ ...	6.30
iv.	8	pieces "kasau jantan" (main rafters and purlins) 10′ × 3″	5.60
v.	40	pieces "kasau kechil" (rails) ...	6.00
vi.	40	pieces bamboo 16′ — 18′ long ...	32.00
vii.	60	pieces gunny sacking	30.00
viii.	250	pieces attaps	5.00
ix.	400	pieces bamboo broties	32.00
x.	2	pieces planks (door)	2.50
xi.	18	pieces 3″ × 3″ × 16′ kasau (beams)	27.00
xii.	2	pieces old galvanised iron sheets ...	10.00
xiii.	7	lbs. nails, hinges etc.	4.00
xiv.	1	empty 44 gallon drum	6.00
xv.		Labour	70.00
		Total ...	$250.00

4. **COAGULATING EQUIPMENT:**

i.	3 Aluminium lined coagulating tanks 9¾′ × 33½″ × 11″ × 16g. (150 gallons) with 74 aluminium partitions ...	$1,200.00
ii.	2 smooth rubber mangles	100.00
iii.	1 marked rubber mangle	50.00
iv.	1 weighing machine (small)	200.00
v.	1 daching (steelyard)	22.50
vi.	1 simplexometer or metrolac ...	22.50
vii.	2 one pint measure with a receptacle for simplexometer reading	3.00
viii.	1 Chinese goldsmith's balance ...	8.00
ix.	20 aluminium latex cups	2.00
x.	1 measuring glass	5.00
xi.	1 gallon measure	7.00
xii.	1 five gallon bucket	3.00
xiii.	1 big wooden stirrer	2.00
xiv.	2 strainers	10.00
xv.	1 smoke-house thermometer ...	7.00
xvi.	2 Shanghai jars (40 gal. capacity) ...	50.00
xvii.	20 kerosene tins with covered lids ...	14.00
	Total ...	$1,698.50

5. **COST OF PRODUCTION OF 1 PICUL:**

Assuming an output of 60 piculs per month:

i.	Factory labour	$3.00
ii.	Formic acid and anti-coagulant ...	.50
iii.	Transport	.44
iv.	Licence	.07
v.	Rent on land	.02
vi.	Watchman	.17
vii.	Firewood	.25
viii.	Miscellaneous	.10
	Total ...	$4.55

6. **SUMMARY:**

Cost of Factory	$ 160.00
Cost of store	60.00
Cost of smoke-house	250.00
Cost of factory equipment	1,698.50
	$2,168.50
Licence fee ($50/- a year) together with deposit	300.00
Working capital to purchase latex (10 days output = 40 piculs × $50/-) ...	2,000.00
Miscellaneous expenditure	31.50
TOTAL ...	$4,500.00

APPENDIX "B"

Production of Smallholders' Rubber from Central Factory—Kampong Batu Hampar

MONTHS	R.S.S. 1		R.S.S. 2		R.S.S. 3		Off Grades		Total production in piculs	Total cost of production	Total amount of receipts	Average price per picul received	Average profit per picul
	piculs	%	piculs	%	piculs	%	piculs	%		$	$	$	$
March	—	—	3.00	15	17.14	85	—	—	20.14	879.34	844.20	41.92	—1.74
April	21.00	25.6	45.53	56	14.06	17.3	.87	1.1	81.46	3,463.16	3,446.70	42.31	— .20
May	27.56	69.3	11.50	28.9	—	—	.70	1.8	39.76	1,578.77	1,638.57	41.02	1.50
June	22.29	73.4	7.00	23.1	—	—	1.05	3.5	30.34	1,111.88	1,137.35	37.49	.84
July	37.51	91.6	3.00	7.3	—	—	.46	1.1	40.97	1,502.63	1,634.50	39.87	3.22
August	51.93	99.1	—	—	—	—	.46	.9	52.39	1,925.08	2,231.61	42.57	5.85
September	52.03	98.6	—	—	—	—	.72	1.4	52.75	2,296.78	2,575.98	49.50	5.64
October	24.00	100.0	—	—	—	—	—	—	24.00	1,196.40	1,272.00	53.00	3.15
November	54.29	99.0	—	—	—	—	.68	1.0	54.97	2,792.96	3,038.76	55.26	4.47
December	57.43	98.8	—	—	—	—	.69	1.2	58.12	3,243.76	3,390.14	58.33	2.52
TOTAL ...	348.04		70.03		31.20		5.63		454.90	19,990.76	21,209.81		2.68